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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,164	04/07/2004	Michael Bourgoin	07844-647001/P600	1268

21876 7590 06/10/2008
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EXAMINER	
GUERTIN, AARON M	
ART UNIT	**PAPER NUMBER**
2628	

MAIL DATE	DELIVERY MODE
06/10/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/821,164	**Applicant(s)** BOURGOIN ET AL.	
	Examiner AARON M. GUERTIN	**Art Unit** 2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 May 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,13,14,17-28,31,32 and 35-47* is/are rejected.

7)☐ Claim(s) *11,12,15,16,29,30,33 and 34* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *4/07/2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's Amendments of 5/08/2008 have been fully considered in the preparation of this Office Action.

2. The Examiner acknowledges that claims 1-47 are pending, with claims 1, 19, 37, 42, 44, and 46 being independent, that claims 19-36 and 44-45 have been amended, and that no new matter has been added.

Allowable Subject Matter

3. The indicated allowability of claims 1-18, 37-43, 46, and 47 is withdrawn in view of the newly discovered reference(s) to U.S. Patent 6,462,748 (Fushiki), U.S. Publication No.: US 2002/0031256 A1 (Hiramatasu), and U.S. Publication No.: US 2003/0142222 A1 (Hordley). Rejections based on the newly cited reference(s) follow.

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted on 4/07/2004 has been previously considered by the examiner.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 37-41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 37 discloses within the limitations of a “transformation comprising a matrix followed by curves in a pipeline of a defined color profile architecture…”. The closest embodiment of the specification regarding the transformation comprising a matrix is paragraph [0008] which merely states the same thing and does not define the matrix, the curves or the pipeline in which the transformation is being conducted. Considering it is unclear what is meant by “a matrix followed by curves in a pipeline of a defined color profile architecture” and how it is related to the transformation process, claim 37 has been rendered indefinite. Clarification of “a matrix followed by curves in a pipeline of a defined color profile architecture” is respectfully requested. For the purposes of examination, “a matrix followed by curves in a pipeline of a defined color profile architecture” will be considered to be a function that includes the calculations for luminance for image color correction wherein the image color correction calculates the matrix values by way of following a curve of data specifically mapping out CIE standards for color computation.

8. Claim 38 discloses within the limitations of a “transformation comprises the matrix followed by the curves followed by an additional matrix”. The closest embodiment of the specification regarding the transformation comprising a matrix is paragraph [0008]

which merely states the same thing and does not define the matrix or the curves in which the transformation is being conducted. Considering it is unclear what is meant by “the matrix followed by the curves followed by an additional matrix” and how it is related to the transformation process, claim 38 has been rendered indefinite. Clarification of “transformation comprises the matrix followed by the curves followed by an additional matrix” is respectfully requested. For the purposes of examination, “the matrix followed by the curves followed by an additional matrix” will be considered to be a function that includes the calculations for luminance for image color correction wherein the image color correction calculates the matrix values by way of following a curve of data specifically mapping out CIE standards for color computation.

9. Any claim not specifically addressed above is being rejected as incorporating the deficiencies of the claims upon which it depends.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1-3, 5-9, 13, 17-21, 23-27, 31, 36, 36, and 42-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,462,748 (Fushiki) in view of U.S. Publication No.: US 2002/0031256 A1 (Hiramatasu).

12. Regarding claim 1, Fushiki teaches of a machine-implemented method ([Column 1, lines 12-15] - *relates generally to computer graphics, and more particularly to the use of a computer to perform various color processing operations… on a color object.*) comprising: **generating a color profile** ([Fig. 4, (124, 126, and 128)] and [Column 8, lines 9-34] - *the ICC profile 124 of the sRGB space can be used together with the ICC profile 122 of the input device to convert the color data 120 to the sRGB color space 100 to form the color object 70… the color data 126 or 128 are used to create a color object in the respective color space…*) **that conforms to a defined color profile architecture** ([Fig. 4, (122)] and [Column 8, lines 9-34] - *the ICC profile 124 of the sRGB space can be used together with the ICC profile 122 of the input device to convert the color data 120 to the sRGB color space 100 to form the color object 70…*); **and that defines a multistage transform** ([Fig. 3, (70a-70e)] and [Column 6, lines 47-65] - *By way of example, FIG. 3 illustrates an exemplary sequence of color processing operations…*); **capable of translating a first color space** ([Fig. 4, (100)]) **to a second color space** ([Fig. 4, (102)])**; processing an image** (executing the transform) **using the color profile** ([Fig. 4, (124, 126, and 128)] and [Column 8, lines 9-34] - *the ICC profile 124 of the sRGB space can be used together with the ICC profile 122 of the input device to convert the color data 120 to the sRGB color space 100 to form the color object 70… the color data 126 or 128 are used to create a color object in the respective color space…*)**; and outputting the image** ([Fig. 4, (96)] and [Column 2, lines 60-65 - *Input and output color conversions may be performed to interface with input and output*

devices that use different color spaces…). Fushiki further teaches wherein **one of the first and second color spaces is the image color space** ([Fig. 4, (100)]) **and the other of the first and second color spaces is a profile connection space** ([Fig. 4, (102)]) and **affecting two stages of the multistage transform** ([Fig. 3, (70a-70e)] and [Column 6, lines 3-25] - *Optimal quality of color processing is achieved by selectively performing a color processing operation in the more suitable one of the two color space…* [Column 6, lines 46-65] - *Two perceptual-based operations, gamut mapping and saturation adjustments, are performed on the color object 70 by corresponding operation modules 110 (FIG. 2) of the graphics engine…*).

Fushiki teaches the limitations of claim 1 above, however, Fushiki fails to specifically teach of wherein an image comprises **a parameterized encoding of an image color space with image parameters defining a range and an offset of an image component of the image, and a white point of the image color space;** and generating the color profile comprises **affecting the multistage transform based on the image parameters**.

Hiramatasu teaches of a machine-implemented method ([0002] - *The present invention relates to a color matching method, a color matching device, a color matching program, and a computer readable record medium that stores the color matching program… which are used for converting digital image data reproducible by a device such as a CRT…*); wherein a image comprises **a parameterized encoding of an image color space** ([0082] and [0083] - *data of a white point and a black point of the input color space and data of a white point and a black point of the output color space*

are obtained… (conversion parameter) is set based on each white point data obtained… a color space compression parameter is derived for appropriately converting data within the input color space into data within output color space…) **with image parameters defining a range** ([0025] - *image data within the color reproduction range of the first device is converted using a conversion parameter into image data within the color reproduction range of the second device…)* **and an offset of an image component of the image** ([0085] - *the color space compression processing on the absolute color space is performed… of the input image data as the target of conversion. Specifically, four conversion processes are performed including correction of a white point, compression (including expansion; the same applies below) in the direction of chroma, correction of hue, and compression in the direction of lightness…*) (offsets exist in the correction of components)**, and a white point of the image color space** ([0082] and [0083] - *data of a white point and a black point of the input color space and data of a white point and a black point of the output color space are obtained… (conversion parameter) is set based on each white point data obtained…*). Hiramatasu also teaches of wherein a color profile comprises **affecting the multistage transform based on the image parameters** ([Fig. 4, (s411)] and [0096] - *the color space compression processing on the absolute color space is performed and output data represented in the L*a*b* space is obtained, in step S411, the output data is converted into data represented in a color space dependent on the output device…*).

Hiramatasu further teaches the benefits of using conversion parameters when color matching and processing, and how by taking image characteristics with respect to

color spaces and using said characteristics during processing, that higher computation processing speeds can be achieved ([0024] - *allow an appropriate color matching that takes into account characteristics of the input color space and the output color space to be performed at high speed…* [0027] - *conversion parameter is determined based on the respective data related to the specific color of the first device and the second device… In addition, higher computation processing speed for parameter determination can be achieved when compared to the case in which the conversion parameter is determined based on numerous color data…*).

All of the elements of claim 1, are known in Fushiki in view of Hiramatasu, the only difference is the combination of know elements into a single system and method.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Fushiki the image conversion parameters taught by Hiramatasu, as the benefits of using conversion parameters when color matching and processing, and by taking image characteristics with respect to color spaces and using said characteristics during processing, will allow higher computation processing speeds within color spaces (Hiramatasu – [0024], [0027], and [0028]).

13. Regarding claim 2, Fushiki and Hiramatasu teach the limitations of claim 1 above, and Hiramatasu further teaches of the color profile further comprises **increasing image processing precision by fitting output to input data scopes based on the parameterized encoding of the image** ([0027] - *the precision of color matching improves when compared to the case in which the color matching is performed using a*

pre-fixed conversion parameter. In addition, higher computation processing speed for parameter determination can be achieved when compared to the case in which the conversion parameter is determined based on numerous color data… and [0028] - *Therefore, it becomes possible to provide a color matching method that allows appropriate color matching that takes into account the characteristics of the input color space and the output color space to be performed at a higher speed.*).

Fushiki further teaches of fitting the processing **between the two stages of the multistage transform** ([Fig. 3, (70a-70e)] and [Column 6, lines 3-25] - *Optimal quality of color processing is achieved by selectively performing a color processing operation in the more suitable one of the two color space…* [Column 6, lines 46-65] - *Two perceptual-based operations, gamut mapping and saturation adjustments, are performed on the color object 70 by corresponding operation modules 110 (FIG. 2) of the graphics engine…*).

14. Regarding claim 3, Fushiki and Hiramatasu teach the limitations of claims 1 and 2 above, and Fushiki further teaches of wherein the generating the color profile further comprises **affecting three stages** ([Fig. 3, (70a-70e)] and [Column 6, lines 3-25] - *FIG. 3 illustrates an exemplary sequence of color processing operations… Two perceptual-based operations, gamut mapping and saturation adjustments, are performed… The next color processing operation is alpha-masking, and the graphics engine 72 determines that this operation should be performed in the physical-based color space 102…*), **which include the two stages, of the multistage transform such that the**

color profile effects chromatic adaptation ([Fig. 3, (70a-70e)] and [Column 6, lines 3-25] - *Optimal quality of color processing is achieved by selectively performing a color processing operation in the more suitable one of the two color space…* [Column 6, lines 46-65] - *Two perceptual-based operations, gamut mapping and saturation adjustments, are performed on the color object 70 by corresponding operation modules 110 (FIG. 2) of the graphics engine…*).

Hiramatasu further teaches of wherein the generating the color profile **chromatic adaptation according to the white point** ([0082] and [0083] - *data of a white point and a black point of the input color space and data of a white point and a black point of the output color space are obtained… (conversion parameter) is set based on each white point data obtained…*), **transcodes the image component according to the range and the offset** ([0025] - *image data within the color reproduction range of the first device is converted using a conversion parameter into image data within the color reproduction range of the second device…* [0085] - *the color space compression processing on the absolute color space is performed… of the input image data as the target of conversion. Specifically, four conversion processes are performed including correction of a white point, compression (including expansion; the same applies below) in the direction of chroma, correction of hue, and compression in the direction of lightness…*) (offsets exist in the correction of components); and the fitting comprises **fitting output to input data scopes** ([0027] - *higher computation processing speed for parameter determination can be achieved when compared to the case in which the conversion parameter is determined based on numerous color data…* and [0028] -

Therefore, it becomes possible to provide a color matching method that allows appropriate color matching that takes into account the characteristics of the input color space and the output color space to be performed at a higher speed.).

Fushiki further teaches of fitting the processing output to input data **among the stages** ([Fig. 3, (70a-70e)] and [Column 2, lines 60-65] - *Input and output color conversions may be performed to interface with input and output devices that use different color spaces.* [Column 6, lines 3-25] - *Optimal quality of color processing is achieved by selectively performing a color processing operation in the more suitable one of the two color space…* [Column 6, lines 46-65] - *Two perceptual-based operations, gamut mapping and saturation adjustments, are performed on the color object 70 by corresponding operation modules 110 (FIG. 2) of the graphics engine…*).

15. Regarding claim 5, Fushiki and Hiramatasu teach the limitations of claims 1 and 2 above, and Hiramatasu further teaches of wherein **taking into account at least a portion of the image parameters** ([0082] and [0083] - *data of a white point and a black point of the input color space and data of a white point and a black point of the output color space are obtained… (conversion parameter) is set based on each white point data obtained… a color space compression parameter is derived for appropriately converting data within the input color space into data within output color space…*). Fushiki teaches further of **within a stage of a transform-defining element of the defined color profile architecture** ([Fig. 3, (70a-70e)], [Fig. 4, (122)] and [Column 6, lines 47-65] - *By way of example, FIG. 3 illustrates an exemplary sequence of color*

processing operations… [Column 8, lines 9-34] - *the ICC profile 124 of the sRGB space can be used together with the ICC profile 122 of the input device to convert the color data 120 to the sRGB color space 100 to form the color object 70…*); the transform-defining element comprising **at least three stages and at most five stages** ([Fig. 3, (70a-70e)]).

16. Regarding claim 6, Fushiki and Hiramatasu teach the limitations of claim 1, 2, and 5 above, and Hiramatasu further teaches of wherein the image color space comprises **a CIELAB color space,** and the profile connection space comprises **a CIEXYZ color space** ([0100] - *The L*a*b* data of the white point and the black point of the input color space is derived… from a profile of the input color space… profile of each color space is data represented in a color space other than the L*a*b* space, such as data represented in the XYZ (Yxy) space… defined by CIE (International Commission on Illumination)*).

17. Regarding claim 7, Fushiki and Hiramatasu teach the limitations of claim 1, 2, 5, and 6 above, Fushiki further teaches of wherein the image color space comprises teaches of wherein the defined color profile architecture comprises **an International Color Consortium color profile architecture** ([Fig. 4, (122)] and [Column 8, lines 9-34] - *the ICC profile 124 of the sRGB space can be used together with the ICC profile 122 of the input device to convert the color data 120 to the sRGB color space 100 to form the color object 70…*),and Hiramatasu further teaches of wherein the transform -

defining element (correction parameter) comprises **a lutAtoB tag** ([0100] - *L*a*b* data of the white point and the black point of the input color space is derived by performing color conversion on a value corresponding to the color white… and a value corresponding to the color black…* and [0116] - *In this case, the white point correction parameter is derived from the ab-value (a, b) of the white point in the input color space as an amount of movement (-a, -b) of the white point and an amount of movement (0, 0) of the black point*).

18. Regarding claim 8, Fushiki and Hiramatasu teach the limitations of claim 1 above, and Hiramatasu further teaches of **wherein the first color space is the image color space and the second color space is the profile connection space** ([0100] - *The L*a*b* data of the white point and the black point of the input color space is derived by performing color conversion on a value corresponding to the color white… and a value corresponding to the color black… from a profile of the input color space… the profile of each color space is data represented in a color space other than the L*a*b* space, such as data represented in the XYZ (Yxy) space, it is converted as required into L*a*b* data using a transformation expression or the like defined by CIE (International Commission on Illumination).*), the method further comprising **receiving the image** ([0084] - *When the color space compression parameter is set, in step S405, a pixel value (image data) of an input image to be the target of data conversion is obtained…*).

19. Regarding claim 9, Fushiki and Hiramatasu teach the limitations of claims 1-3 above, and Fushiki further teaches of wherein the affecting the two stages comprises: **determining a first processing stage of a transform-defining element of the defined color profile architecture** ([Fig. 4, (122)])**; determining a second processing stage of the transform-defining element** ([Fig. 3, (70a-70e)] and [Column 6, lines 3-25] - *Optimal quality of color processing is achieved by selectively performing a color processing operation in the more suitable one of the two color space…* [Column 6, lines 46-65] - *Two perceptual-based operations, gamut mapping and saturation adjustments, are performed on the color object 70 by corresponding operation modules 110 (FIG. 2) of the graphics engine…*), **and determining a third processing stage of the transform-defining element** ([Column 6, lines 46-65] - *The next color processing operation is alpha-masking, and the graphics engine 72 determines that this operation should be performed in the physical-based color space 102…gamut mapping and saturation adjustments, are performed on the color object 70 by corresponding operation modules 110 (FIG. 2) of the graphics engine…*); **wherein the first processing stage accounts** for color adjustments ([Fig. 3, (70a)] and [Column 6, lines 46-65] - *gamut mapping and saturation adjustments, are performed on the color object 70 by corresponding operation modules 110 (FIG. 2) of the graphics engine…*); **wherein the second processing stage defines at least a portion of a conversion of the image color space to a chromatic adaptation color space** ([Fig. 3] - as the conversion conducts from 70a to 70b (second processing stage) the conversion adapts

the image perceptual based color space (100) to the chromatic physical based color space (102)).

Hiramatasu further teaches wherein transformation stages comprise of several steps. The first step is shown in Fig.4, (S401-S403) wherein the color profile architecture is correlated and **accounts for the range and the offset** (defined in claim 1 as parameters) ([Fig. 4, (S403)]). Hiramatasu has a second transformation step including a conversion (Fig. 4, (S407)), and furthermore Hiramatasu teaches of **wherein the third processing stage defines a chromatic adaptation in the chromatic adaptation color space according to the white point** ([Fig. 4, (S409)] and [0085] - *Thereafter, in step S409, the color space compression processing on the absolute color space is performed…. Specifically, four conversion processes are performed including correction of a white point…*).

20. Regarding claim 13, the rationale disclosed in the rejection of claim 9 is incorporated herein.

21. Regarding claim 17, Fushiki and Hiramatasu teach the limitations of claim 1 above, and Fushiki further teaches of wherein the processing the image using the color profile comprises **embedding the color profile in the image** ([Column 8, lines 9-26] - *In the case the input device supports the ICC standard, the color data 120 provided by the input device will have attached thereto a device color profile 122… the ICC profile 124 of the sRGB space can be used together with the ICC profile 122 of the input*

device to convert the color data 120 to the sRGB color space 100 to form the color object 70), and the outputting the image comprises **saving the image to a storage device** ([Column 5, lines 60-67] through [Column 6, lines 1-3] - *The processed color object may be stored on a storage device 92, such as a hard disk or recordable digital video disk, etc…*).

22. Regarding claim 18, Fushiki and Hiramatasu teach the limitations of claim 1 above, and Fushiki further teaches of wherein the processing the image using the color profile comprises **transforming the image from the image color space to a working color space** ([Column 2, lines 37-65] - *The graphics engine of the system includes a module for converting a color object from the perceptual-base color space to the physical-based color space and from the physical-based color space to the perceptual-based color space*…), and the outputting the image comprises **saving the image to a memory** ([Column 5, lines 60-67] through [Column 6, lines 1-3] - *The processed color object may be stored on a storage device 92, such as a hard disk or recordable digital video disk, etc…*).

23. Regarding claim 19, it is similar in scope to claim 1. Said claim is only different in that it includes a storage device machine readable medium having a software product tangibly embodied therein, the software product comprising instructions operable to cause one or more data processing apparatus to perform operations (Fushiki - [Column 3, lines 32-51] - *as being implemented in a suitable computing environment. Although*

not required, the invention will be described in the general context of computer-executable instructions, such as program modules, being executed by a personal computer… program modules may be located in both local and remote memory storage devices…).

Therefore claim 19 is rejected under the same rationale as claim 1 and in further view of the rationale provided by Fushiki - ([Column 3, lines 32-51]).

24. Regarding claims 20, 21, 23-27, 31, 35, and 36 they are similar in scope to claims 2, 3, 5-9, 13, 17, and 18 respectively. Said claims are different only in that they disclose a storage device machine readable medium. Fushiki teaches of a storage device machine readable medium within [Column 3, lines 32-51] (as further disclosed in the rationale provided in claim 19 above).

Therefore, claims 20, 21, 23-27, 31, 35, and 36 are rejected under the same rational as claims 2, 3, 5-9, 13, 17, and 18 and in further view of the rationale provided by Fushiki [Column 3 lines 32-51] as claim 19 above.

25. Regarding claim 42, the rationale disclosed in the rejection of claims 1 and 2 are incorporated herein.

26. Regarding claim 43, the rationale disclosed in the rejection of claims 1, 2, and 3 are incorporated herein.

27. Regarding claims 44 and 45, they are similar in scope to claims 42 and 43 respectively. Said claims are different only in that they disclose a storage device machine readable medium having a software product tangibly embodied therein, the software product comprising instructions operable to cause one or more data processing apparatus to perform operations. Fushiki teaches of a storage device machine readable medium within [Column 3, lines 32-51] (as further disclosed in the rationale provided in claim 19 above).

Therefore, claims 44 and 45 are rejected under the same rational as claims 42 and 43 and in further view of the rationale provided by Fushiki [Column 3 lines 32-51] as claim 19 above.

28. Regarding claim 46, the rationale disclosed in the rejection of claims 1, 2, and 3 are incorporated herein.

29. Regarding claim 47, the rationale disclosed in the rejection of claims 1, 2, 3, and 5 are incorporated herein.

30. Claim 4, 10, 14, 22, 28, 32, and 37-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,462,748 (Fushiki) and U.S. Publication No.: US 2002/0031256 A1 (Hiramatasu) as applied to claims 1-3 above, and further in view of U.S. Publication US 2003/0142222 A1 (Hordley).

31. Regarding claim 4, Fushiki and Hiramatasu teach the limitations of claims 1-3 above, and Hiramatasu further teaches of wherein **the image parameters of the parameterized encoding define ranges, offsets** ([0082] and [0083] - *data of a white point and a black point of the input color space and data of a white point and a black point of the output color space are obtained… (conversion parameter) is set based on each white point data obtained… a color space compression parameter is derived for appropriately converting data within the input color space into data within output color space…* [0025] - *image data within the color reproduction range of the first device is converted using a conversion parameter into image data within the color reproduction range of the second device…*[0085] - *the color space compression processing on the absolute color space is performed… of the input image data as the target of conversion. Specifically, four conversion processes are performed including correction of a white point, compression (including expansion; the same applies below) in the direction of chroma, correction of hue, and compression in the direction of lightness…*) (offsets exist in the correction of components).

Fushiki and Hiramatasu teach the limitations of claims 1-3 above, however Fushiki and Hiramatasu fail to teach of wherein image parameters include **bit depths of image components of the image**, and the color profile comprises **a bit-depth independent color profile**.

Hordley teaches of a machine-implemented method ([0051] - *The colour signal to be processed may be obtained from a camera, a multispectral imaging device, or a*

scanner, or may be a computer generated RGB etc. signal.) wherein image parameters include **bit depths** (color depth) **of image components of the image**, and the color profile comprises **a bit-depth independent color profile** ([0096] - *Variation of the magnitude of the illumination colour temperature vector produces a variation in depth of colour but does not alter the nature of the colour. Thus the colour warmness or colour depth can be increased or decreased by altering the magnitude of the illumination colour temperature…*). Hordley further teaches the benefits of using a modification based on bit or color depth and wherein the manipulation of the bit or color depth parameter causes enhancement of a final image without altering the illumination or the original object producing the image ([0098] - *the illumination intensity vector can be increased or decreased so as to brighten or darken the overall picture. This allows enhancement of a final image without altering the illumination or the original object producing the image*).

All of the elements of claim 4, are known in Fushiki and Hiramatasu in view of Hordley, the only difference is the combination of know elements into a single system and method.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Fushiki and Hiramatasu the image conversion parameter of bit or color depths taught by Hordley, as the benefits of using conversion parameters when color matching and processing, as adjustments to the bit or color depth are independent of the color profile therefore an enhancement of a final image without

altering the illumination or the original object producing the image can be made (Hordley - [0098]).

32. Regarding claim 10, Fushiki and Hiramatasu teach the limitations of claims 1-3 above, and Fushiki further teaches of wherein the transform-defining element comprises **five processing 'stages** ([Fig. 3, (70a-70e)]), and the first, second and third processing stages comprise **interior stages** (using ICC) ([Fig. 4, (122)] and [Column 8, lines 9-34] - *the ICC profile 124 of the sRGB space can be used together with the ICC profile 122 of the input device to convert the color data 120 to the sRGB color space 100 to form the color object 70…*) **of the five processing stages** ([Fig. 3, (70a-70e)]).

Hiramatasu teaches of wherein a first (Fig. 4, S401 and S402) processing stage (Fig. 4, S401 and S402) comprises **commingling** (mixing) **of image channels** (L or A or B) ([0155] - *Referring to FIG. 10, first, specific color data is obtained in step S1001. Unlike the first embodiment, here, L*a*b* data of a white point, a black point, a blue point, a red point, and a green point of the input color space and L*a*b* data of a white point and a black point of the output color space are obtained…* [0156] - *The amount of movement of a color having lightness between the white point and the black point is calculated by interpolation according to each L-value when the correction processing of the white point is actually performed…*)**; multidimensional** (interpolation using more than one data set (e.g. Interpolation requiring at least 2 known data points to construct need data points within the range of the discrete set)) **interpolation that governs commingling** (mixing) **of image channels** ([0155] - *Referring to FIG. 10, first, specific*

*color data is obtained in step S1001. Unlike the first embodiment, here, L*a*b* data of a white point, a black point, a blue point, a red point, and a green point of the input color space and L*a*b* data of a white point and a black point of the output color space are obtained…* [0156] - *The amount of movement of a color having lightness between the white point and the black point is calculated by interpolation according to each L-value when the correction processing of the white point is actually performed…*)**.** Hiramatasu has a second transformation step including a conversion (Fig. 4, (S407)), the second processing stage comprises **one dimensional** (conversion using one data set (e.g. RGB > LAB)) **transforms** ([0084] - *in step S407, the obtained input image data is converted into image data represented in an absolute color space. This data represented in the RGB space is converted into data represented in a color space independent of the device (L*a*b* space, for instance) by a masking technique and the like*)**,** and **a the third processing stage** (Hiramatasu further teaches of wherein the third processing stage defines a chromatic adaptation in the chromatic adaptation color space according to the white point ([Fig. 4, (S409)] and [0085] - *Thereafter, in step S409, the color space compression processing on the absolute color space is performed…. Specifically, four conversion processes are performed including correction of a white point…*).)

Hiramatasu teaches of interpolation and the use of creating tables however fails to specifically connect the interpolation with a table. However considering Hiramatasu teaches that crating a table allows direct conversion from the input color space into the output color space a high speed ([0017] - *Specifically, the technique involves calculating*

the conversion parameter at a high speed, creating a ***table*** *that allows direct conversion from the input color space into the output color space using the calculated conversion parameter, and performing the color conversion by utilizing this table*…) it would have been obvious to one of ordinary skill in the art at the time the invention to have created an interpolation table to assist in the processing and conversion using L*A*B values in the color space.

Fushiki and Hiramatasu teach the limitations of claim 10 above, however both Fushiki and Hiramatasu fail to specifically teach wherein a processing stage comprises a matrix. Hordley teaches of a machine-implemented method ([0051] - *The colour signal to be processed may be obtained from a camera, a multispectral imaging device, or a scanner, or may be a computer generated RGB etc. signal.*) wherein a processing stage comprises **a matrix** ([0207] - *using the XYZ colour matching functions, plotted in FIG. 12, the XYZ response was calculated for the red, green, yellow, purple, white, blue and orange patches under the 10 Planckian illuminants. The best 3.times.3 matrix transform mapping XYZs to corresponding SONY RGBs was found. Finally the LCDs were calculated and rotated according to the rotation matrix derived…*).

Hordley also teaches that the gamut of possible image chromaticities depended on the illuminant color, that the illuminant color itself is quite limited, and that the chromaticities of real illuminants tend to be tightly clustered around the Planckian locus ([0004] - *The chromaticity constancy problem has proven to be much more tractable. In Color in perspective (IEEE Transactions, pages 1034 to 1038, October 1996), Finlayson made two important observations. First, was that the gamut of possible image*

chromaticities depended on the illuminant colour (this result follows from previous work on 3-dimensional RGB gamuts) and second, that the illuminant colour was itself quite limited. The chromaticities of real illuminants tend to be tightly clustered around the Planckian locus.) Furthermore Hordley teaches that the illumination is specifically calculated by a rotation matrix ([0122] - *Log chromaticity differences (LCDs) for 7 surfaces (green, yellow, white, blue, purple, orange and red) under 10 Planckian lights… are calculated and rotated according to the SONY rotation matrix…*). Considering the colors that are perceived depend almost exclusively on surface reflectance, and illumination is strongly depended upon, Hordley teaches of the benefit of the rotation matrix to remove the dependency due to illuminant color through color constancy computation ([0002]).

All of the elements of claim 10, are known in Fushiki and Hiramatasu in view of Hordley, the only difference is the combination of know elements into a single system and method.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Fushiki and Hiramatasu the image color correction by use of matrix calculations taught by Hordley, as the benefits of removing the dependence due to illuminant color would improve the gamut of possible image chromaticities, therefore enhancing image production and consistency in color within color signal processing (Hordley - [00002], [0004], [0122], and [0186]).

33. Regarding claim 14, the rationale disclosed in the rejection of claim 10 is incorporated herein.

34. Regarding claims 22, 28, and 32, they are similar in scope to claims 4, 10, and 14 respectively. Said claims are different only in that they disclose a storage device machine readable medium. Fushiki teaches of a storage device machine readable medium within [Column 3, lines 32-51] (as further disclosed in the rationale provided in claim 19 above).

Therefore, claims 22, 28, and 32 are rejected under the same rational as claims 4, 10, and 14 and in further view of the rationale provided by Fushiki [Column 3 lines 32-51] as claim 19 above.

35. Regarding claim 37, it is similar in scope to claims 1 and 2 above (therefore the rejection rationale of claims 1 and 2 are incorporated herein). Said claim is only different in that it teaches of a system (Fushiki - [Fig. 1]) comprising: **a device** (Fushiki - [Fig. 1])**; and a data processing machine** (Fushiki - [Fig. 1, (20)]) comprising **an input-output interface** (Fushiki - [Fig. 1, (46 and 48)])**, an operating system** (Fushiki - [Fig. 1, (35)])**, and a color management software component** (Fushiki - [Fig. 1, (36, 37, and 38)]) **in a pipeline** (Fushiki - [Fig. 2, (72 - specifically procedures within the renderer)]). Claim 37 further differs from the scope of claims 1 and 2 by further comprising **a matrix followed by curves**.

The rejection rationale for claims 1 and 2 include the combination of Fushiki and Hiramatasu. Fushiki and Hiramatasu teach all the limitations of claims 1 and 2 however; both Fushiki and Hiramatasu fail to specifically teach of **a matrix followed by curves**. Hordley teaches of a system ([0051] - *The colour signal to be processed may be obtained from a camera, a multispectral imaging device, or a scanner, or may be a computer generated RGB etc. signal.*) wherein a processing stage comprises **a matrix** ([0207] - *using the XYZ colour matching functions, plotted in FIG. 12, the XYZ response was calculated for the red, green, yellow, purple, white, blue and orange patches under the 10 Planckian illuminants. The best 3.times.3 matrix transform mapping XYZs to corresponding SONY RGBs was found. Finally the LCDs were calculated and rotated according to the rotation matrix derived…*) **followed by curves** ([Fig. 5] and [0114] - *FIG. 5: CIE xy chromaticity diagram. Solid curved line is the chromaticity locus for all typical Planckian black-body lights. From left to right illuminants begin bluish, become whitish then yellowish ending in reddish light. Crosses (`+`) denote chromaticities of typical natural and man-made lights.*).

Hordley also teaches that the gamut of possible image chromaticities depended on the illuminant color, that the illuminant color itself is quite limited, and that the chromaticities of real illuminants tend to be tightly clustered around the Planckian locus ([0004] - *The chromaticity constancy problem has proven to be much more tractable. In Color in perspective (IEEE Transactions, pages 1034 to 1038, October 1996), Finlayson made two important observations. First, was that the gamut of possible image chromaticities depended on the illuminant colour (this result follows from previous work*

on 3-dimensional RGB gamuts) and second, that the illuminant colour was itself quite limited. The chromaticities of real illuminants tend to be tightly clustered around the Planckian locus.) Furthermore Hordley teaches that the illumination is specifically calculated by a rotation matrix ([0122] - *Log chromaticity differences (LCDs) for 7 surfaces (green, yellow, white, blue, purple, orange and red) under 10 Planckian lights… are calculated and rotated according to the SONY rotation matrix…*). Considering the colors that are perceived depend almost exclusively on surface reflectance, and illumination is strongly depended upon, Hordley teaches of the benefit of the rotation matrix to remove the dependency due to illuminant color through color constancy computation ([0002]).

All of the elements of claim 10, are known in Fushiki and Hiramatasu in view of Hordley, the only difference is the combination of know elements into a single system and method.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Fushiki and Hiramatasu the image color correction by use of matrix calculations by way of a curve of data specifically mapping out the well known Planckian lights taught by Hordley, as the benefits of removing the dependence due to illuminant color would improve the gamut of possible image chromaticities, therefore enhancing image production and consistency in color within color signal processing (Hordley - [00002], [0004], [0122], and [0186]).

36. Regarding claim 38, Fushiki, Hiramatasu and Hordley teach the limitations of claim 37 above, and Hiramatasu further teaches of **wherein the image parameters further define a white point of the image color space** ([0082] and [0083] - *data of a white point and a black point of the input color space and data of a white point and a black point of the output color space are obtained… (conversion parameter) is set based on each white point data obtained… a color space compression parameter is derived for appropriately converting data within the input color space into data within output color space…* [0085] - *the color space compression processing on the absolute color space is performed… of the input image data as the target of conversion. Specifically, four conversion processes are performed including correction of a white point, compression (including expansion; the same applies below) in the direction of chroma, correction of hue, and compression in the direction of lightness…*). Hordley further teaches of and the transformation comprises **the matrix followed by the curves** (the rejection rationale of claim 37 above is incorporated herein). Hordley further teaches wherein the calculations are followed **by an additional matrix** ([0183] - *The co-variance matrix of this point set is given by Equation (17)…* [0186] *To find the rotation satisfying Equation (18) it is necessary to find the co-ordinate axis along which the variation (or variance) due to illumination is minimum. To do this first note that covariance matrix .SIGMA.(M) can be uniquely decomposed, as in Equation (19), where U is a rotation matrix and D is a strictly positive diagonal matrix…*).

37. Regarding claim 39, the rejection rationale of claim 3 is incorporated herein.

38. Regarding claim 40, the rejection rationale of claim 10 is incorporated herein. With the addition wherein Hordley further teaches the limitation of **a matrix stage** ([0207] - *using the XYZ colour matching functions, plotted in FIG. 12, the XYZ response was calculated for the red, green, yellow, purple, white, blue and orange patches under the 10 Planckian illuminants. The best 3.times.3 matrix transform mapping XYZs to corresponding SONY RGBs was found. Finally the LCDs were calculated and rotated according to the rotation matrix derived…*).

39. Regarding claim 41, Fushiki, Hiramatasu and Hordley teach the limitations of claims 37-40 above, and Fushiki further teaches of wherein the device comprises **a display integrated with the data processing machine** ([Column 3, lines 31-51] - *the invention may be practiced with other computer system configurations, including hand-held devices… minicomputers, mainframe computers, and the like.*).

Allowable Subject Matter

40. Claims 11, 12, 15, 16, 29, 30, 33, and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

41. The following is a statement of reasons for the indication of allowable subject matter:

42. The best prior arts of record include Fushiki (US Patent No. 6,462,748), Hiramatasu (US 2002/0031256 A1), and Hordley (U.S. Publication US 2003/0142222 A1), provides a system that includes a machine-implemented method (Fushiki - [Column 1, lines 12-15]) comprising: **generating a color profile** (Fushiki - [Fig. 4, (124, 126, and 128)] and [Column 8, lines 9-34]) **that conforms to a defined color profile architecture** (Fushiki - [Fig. 4, (122)] and [Column 8, lines 9-34]); **and that defines a multistage transform** (Fushiki - [Fig. 3, (70a-70e)] and [Column 6, lines 47-65]); **capable of translating a first color space** (Fushiki - [Fig. 4, (100)]) **to a second color space** (Fushiki - [Fig. 4, (102)])**; processing an image** (executing the transform) **using the color profile** (Fushiki - [Fig. 4, (124, 126, and 128)] and [Column 8, lines 9-34])**; and outputting the image** (Fushiki - [Fig. 4, (96)] and [Column 2, lines 60-65). Fushiki further teaches wherein **one of the first and second color spaces is the image color space** ([Fig. 4, (100)]) **and the other of the first and second color spaces is a profile connection space** ([Fig. 4, (102)]) and **affecting two stages of the multistage transform** ([Fig. 3, (70a-70e)], [Column 6, lines 3-25], and [Column 6, lines 46-65]).

Hiramatasu teaches of a machine-implemented method ([0002); wherein a image comprises **a parameterized encoding of an image color space** ([0082] and [0083]) **with image parameters defining a range** ([0025]) **and an offset of an image component of the image** ([0085])**, and a white point of the image color space** ([0082] and [0083]); and **affecting the multistage transform based on the image parameters** ([Fig. 4, (s411)] and [0096]).

Hordley teaches of a machine-implemented method ([0051]) wherein image parameters include **bit depths** (color depth) **of image components of the image**, and the color profile comprises **a bit-depth independent color profile** ([0096]); and wherein a processing stage comprises **a matrix** ([0207]).

43. Regarding claims 11 and 29, Hiramatasu teaches of a first processing stage (Fig. 4, S401 and S402) comprises **commingling** (mixing) **of image channels** (L or A or B) ([0155] and [0156])**; multidimensional interpolation** (See further rejection rationale of claim 4 above).

44. All of the prior art (Fushiki, Hiramatasu, and Hordley) singly or in combination fail to teach or suggest the implementation of **a first stage of making entries of the multidimensional interpolation table positive, and normalizing the entries in the multidimensional interpolation table; a second processing stage that denormalizes output of the first stage, applying a nonlinear function, and scales by a scaling factor; and a third processing stage that denormalizes output of the second processing stage, and performs the chromatic adaptation** as recited in claims 11 and 29.

As a result, the limitations of claims 11 and 29 are objected to, but would be allowable if rewritten in independent form including all of the limitations of the base claim wherein also including any intervening claims.

45. Regarding claims 12 and 30, they depend upon claims 11 and 29 which are objected to but would be allowable if rewritten in independent form including all of the limitations of the base claim wherein also including any intervening claims. Therefore claims 12 and 30 would also be allowable as they depend upon potentially allowable subject matter.

46. Furthermore, all of the prior art (Fushiki, Hiramatasu, and Hordley) singly or in combination fail to teach or suggest the implementation of a first processing stage that performs a **negating a channel of the image color space, and swapping rows in the multidimensional interpolation table having a 1 in the channel with rows in the multidimensional interpolation table having a 0 in the channel; generating a second processing stage that applies a nonlinear function, and applies the offset; and generating a third processing stage that denormalizes output of the second processing stage, and performs the chromatic adaptation** as recited in claims 15 and 33.

As a result, the limitations of claims 15 and 33 are objected to, but would be allowable if rewritten in independent form including all of the limitations of the base claim wherein also including any intervening claims.

47. Regarding claims 16 and 34, they depend upon claims 15 and 33 which are objected to but would be allowable if rewritten in independent form including all of the limitations of the base claim wherein also including any intervening claims. Therefore

claims 16 and 34 would also be allowable as they depend upon potentially allowable subject matter.

Response to Arguments

Response to Remarks:

48. Applicant’s arguments, see Remarks, filed 5/08/2008, with respect to claims 19-36 and 44-45 (rejected under 35 USC 101) have been fully considered and are persuasive. The rejection of claims 19-36 and 44-45 with regards to 35 USC 101 has been withdrawn.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AARON M. GUERTIN whose telephone number is (571)270-1547. The examiner can normally be reached on M-F 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Ulka Chauhan can be reached on 571-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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